



CUDA DOCUMENT GUIDE

This document contains a list of the documents that are provided in support of the CUDA Toolkit and SDK.

Getting Started

Download Location: CUDA Developer downloads page at www.nvidia.com/getcuda

Install Folder: None

Windows

Linux

Mac

Getting Started Guides (PDF):

<platform>Getting_Started_Guide.pdf

This guide contains all the information necessary for installing and checking the correct operation of the CUDA development tools, including system requirements.

No previous experience with CUDA or parallel computation required.

✓ ✓ ✓

CUDA Toolkit 4.0 Readiness for CUDA Applications Technical Brief (PDF):

Technical Brief: CUDA_4.0_Readiness_Tech_Brief.pdf

This document typically describes major changes and improvements over the previous version.

Recommended reading for every CUDA Toolkit release.

✓ ✓ ✓

CUDA SDK New Features Guide (PDF):

CUDA_New_Features_SDK_Guide.pdf

This application note highlights SDK code samples which have either been updated or developed to illustrate new features.

Recommended: Some experience with CUDA SDK.

✓ ✓ ✓

Getting Started with CUDA SDK Samples (PDF):

Getting_Started_with_CUDA_SDK_Samples.pdf

This application note introduces the user to a set of SDK code samples that can be run as an introduction to CUDA.

No previous experience with CUDA or parallel computation required. Experience with C, C++ required.

✓ ✓ ✓

Release Notes and Errata

Download Location: CUDA Developer downloads page at www.nvidia.com/getcuda

Recommended reading for every CUDA Toolkit release.

Windows

Linux

Mac

Release Notes (Text File):

CUDA_Toolkit_Release_Notes.txt

The release notes contain important information about files and supported operating systems and platforms. Release-specific information regarding New Features, Known Issues, and Performance Improvements is included. For major releases you can find helpful notes on migrating from the previous major release.

Install Folder: <Toolkit Install Folder>/CUDA/<version>/doc

✓ ✓ ✓

Release Notes Errata (Text File):

<version>_Release_Notes_Errata.txt

Contains the latest release-specific information for all three platforms that was not included in the Toolkit release notes. For major releases you can find helpful notes on migrating from the previous major release.

Install Folder: <Toolkit Install Folder>/CUDA/<version>/doc

✓ ✓ ✓

CUDA SDK Release Notes (txt):

CUDA_Release_Notes.txt

Install Folder: <NVIDIA GPU Computing SDK version >/doc

Install Folder: <NVIDIA GPU Computing SDK version >/SDK Browser/docs

✓ ✓ ✓

OpenCL SDK Release Notes (txt):

OpenCL_Release_Notes.txt

Install Folder: <NVIDIA GPU Computing SDK version >/doc

Install Folder: <NVIDIA GPU Computing SDK version >/SDK Browser/docs

✓ ✓ ✓

DirectCompute SDK Release Notes (txt):

DirectCompute_Release_Notes.txt

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✓ ✓ ✓

Compute Visual Profiler Release Notes (txt):

Compute_Visual_Profiler_Release_Notes_<platform>.txt

Install Folder: <Toolkit Install Folder>/CUDA/<version>/computeprof

✓ ✓ ✓

CUDA Debugger API Release Notes (txt):

CudaDebuggerAPIReleaseNotes.txt

Included in the CUDA API installer package provided to NVIDIA partners by email.

✓ ✓ ✓

CUDA Libraries

Download Location: CUDA Developer downloads page at www.nvidia.com/getcuda

Install Folder: <Toolkit Install Folder>/CUDA/<version>/doc

Windows

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CUBLAS Library Reference (PDF):

CUBLAS_Library.pdf

This document describes the CUBLAS library which is an implementation of BLAS (Basic Linear Algebra Subprograms) on top of the NVIDIA® CUDA™ runtime. It allows access to the computational resources of NVIDIA GPUs.

✓ ✓ ✓

CUFFT Library Reference (PDF):

CUFFT_Library.pdf

This document describes CUFFT, the CUDA Fast Fourier Transform (FFT) library. The CUFFT library provides a simple interface for computing parallel FFTs on an NVIDIA GPU.

✓ ✓ ✓

CUSPARSE Library Reference (PDF):

CUSPARSE_Library.pdf

This document describes the CUSPARSE library which contains a set of basic linear algebra subroutines used for handling sparse matrices and is designed to be called from C or C++.

✓ ✓ ✓

CURAND Library Reference (PDF):

CURAND_Library.pdf

This document describes the CURAND library which provides facilities that focus on the simple and efficient generation of high-quality pseudorandom and quasirandom numbers.

✓ ✓ ✓

Thrust Quickstart Guide (PDF):

Thrust_Quickstart_Guide.pdf

Thrust is a CUDA library of parallel algorithms with an interface resembling the C++ Standard Template Library (STL). Thrust provides a flexible high-level interface for GPU programming to enhance developer productivity and to develop high-performance applications rapidly.

✓ ✓ ✓

NVIDIA Performance Primitives (NPP) Library Reference (PDF):

NPP_Library.pdf

This document describes the NPP library which contains a set of low level performance primitives, primarily for signal and image processing.

Recommended: For advanced users.

✓ ✓ ✓

CUDA VideoDecoder Library (PDF):

CUDA_VideoDecoder_Library.pdf

This API specification gives developers access to hardware video decoding capabilities on NVIDIA GPUs.

Prerequisite: Install the CUDA Toolkit and SDK.

Recommended: For advanced users. Please refer to the two CUDA SDK samples `cudaDecodeD3D9` and `cudaDecodeGL` for more details.

✓ ✓ -

CUDA VideoEncoder Library (PDF):

CUDA_VideoEncoder_Library.pdf

This document describes the H.264 Video Encoding library.

Prerequisite: Install the CUDA Toolkit and SDK.

Recommended: For beginner-intermediate users.

✓ - -

Developing with CUDA C/C++

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Windows

Linux

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CUDA C Programming Guide (PDF):

CUDA_C_Programming_Guide.pdf

The CUDA parallel programming model is designed to overcome this challenge while maintaining a low learning curve for programmers familiar with standard programming languages such as C.

Recommended: CUDA_C_Best_Practices_Guide.pdf

Install Folder: <NVIDIA GPU Computing SDK version >/C/doc

✓ ✓ ✓

CUDA C Best Practices Guide (PDF):

CUDA_C_Best_Practices_Guide.pdf

The Best Practices Guide is a manual to help developers obtain the best performance from the NVIDIA® CUDA™ architecture using the latest version of the CUDA Toolkit. It presents established optimization techniques and explains coding metaphors and idioms that can greatly simplify programming for the CUDA architecture.

Prerequisite: CUDA_C_Programming_Guide.pdf

Install Folder: <NVIDIA GPU Computing SDK version >/C/doc

✓ ✓ ✓

CUDA Runtime and Driver API Reference (PDF, HTML, chm):

CUDA_Toolkit_Reference_Manual.pdf

CUDA_Toolkit_Reference_Manual.chm

The API reference Manual gives developers detailed information on the CUDA Runtime and Driver API interfaces.

✓ ✓ ✓

Fermi Tuning Guide (PDF):

Fermi_Tuning_Guide.pdf

Fermi™ is NVIDIA's next-generation CUDA™ compute architecture. This document provides an overview on how to tune applications for Fermi.

Recommended also: CUDA_C_Best_Practices_Guide.pdf

✓ ✓ ✓

Fermi Compatibility Guide (PDF):

Fermi_Compatibility_Guide.pdf

The Fermi Compatibility Guide provides guidance to developers to ensure that their software applications are compatible with Fermi.

Prerequisite: CUDA_C_Programming_Guide.pdf, C, C++

✓ ✓ ✓

CUDA Developer Guide for Optimus Platforms (PDF):

CUDA_Developer_Guide_for_Optimus_Platforms.pdf

This document provides guidance to CUDA developers and explains how NVIDIA CUDA APIs can be used to query for GPU capabilities in Optimus systems. It is strongly recommended that users follow these guidelines to ensure that CUDA applications are compatible with all notebooks featuring Optimus.

✓ ✓ ✓

Parallel Thread Execution Instruction Set Architecture Reference (PDF):

ptx_isa_2.3.pdf, ptx_isa_1.4.pdf

These documents describe the Parallel Thread Execution (PTX) instruction set architecture—a low-level parallel thread execution virtual machine and instruction set architecture (ISA). PTX provides an assembly language compilation target for the CUDA compiler.

✓ ✓ ✓

Developing with OpenCL and DirectCompute

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Windows
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OpenCL ImplementationNotes (txt):

OpenCL_Implementation_Notes.txt

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OpenCL Jumpstart Guide (PDF):

OpenCL_Jumpstart_Guide.pdf

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OpenCL Programming Guide(PDF):

OpenCL_Programming_Guide.pdf

Install Folder: <NVIDIA GPU Computing SDK version >/OpenCL/doc

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OpenCL Programming Overview (PDF):

OpenCL_Programming_Overview.pdf

Install Folder: <NVIDIA GPU Computing SDK version >/OpenCL/doc

Install Folder: <Toolkit Install Folder>/CUDA/<version>/doc

✓ ✓ ✓

OpenCL Best Practices Guide (PDF):

OpenCL_Best_Practices_Guide.pdf

This Best Practices Guide is a manual to help developers obtain the best performance from the NVIDIA® CUDA™ architecture using OpenCL. It presents established optimization techniques and explains coding metaphors and idioms that can greatly simplify programming for the CUDA architecture.

Prerequisite: CUDA_C_Programming_Guide.pdf, latest version of the CUDA Toolkit.

Install Folder: <NVIDIA GPU Computing SDK version >/OpenCL/doc

Install Folder: <Toolkit Install Folder>/CUDA/<version>/doc

✓ ✓ ✓

DirectCompute Programming Guide (PDF):

DirectCompute_Programming_Guide.pdf

Install Folder: <NVIDIA GPU Computing SDK version >/DirectCompute/doc

✓ ✓ ✓

CUDA Development Tools	Windows	Linux	Mac
CUDA Occupancy Calculator (Excel Spreadsheet).xls: CUDA_Occupancy_Calculator.xls Download Location: CUDA Developer downloads page at www.nvidia.com/getcuda	✓	✓	✓
cuda-gdb User Manual (PDF): cuda-gdb.pdf This document describes the NVIDIA CUDA Debugger which is a extension to the standard i386/AMD64 port of gdb and the GNU Project debugger. Standard debugging features are inherently supported for host code, and additional features have been provided to support debugging CUDA code. The cuda-gdb debugger supports 32-bit and 64-bit Linux. Download Location: CUDA Developer downloads page at www.nvidia.com/getcuda	-	✓	✓
cuda-memcheck User Manual (PDF): cuda-memcheck.pdf This document describes cuda-memcheck which is a memory-checking feature for detecting and debugging memory errors in CUDA applications and works with cuda-gdb- the CUDA debugger tool. Download Location: CUDA Developer downloads page at www.nvidia.com/getcuda	✓	✓	✓
The NVIDIA CUDA C Compiler Reference Guide (PDF): nvcc.pdf This reference guide provides guidance on usage of the NVIDIA CUDA compiler- nvcc. Install Folder: <Toolkit Install Folder>/CUDA/<version>/doc <i>Recommended also: CUDA_C_Programming_Guide.pdf, CUDA_C_Best_Practices_Guide.pdf</i>	✓	✓	✓
Compute Visual Profiler User Guide(PDF): Compute_Visual_Profiler_User_Guide.pdf This user guide provides usage information for the Compute Visual Profiler product for CUDA and OpenCL.	✓	✓	✓
Command Line Profiler Document (txt): Compute_Profiler.txt This document provides usage information for the command line profiler for CUDA and OpenCL. Install Folder: <Toolkit Install Folder>/CUDA/<version>/doc	✓	✓	✓
cuobjdump (PDF): cuobjdump.pdf This application note describes the cuobjdump tool which is similar to the Linux command line tool- objdump . The cuobjdump tool displays assembly instructions for a particular kernel making it useful for optimization and debugging by advanced users. <i>Recommended: For advanced users.</i>	✓	✓	✓ ¹

¹ For advanced users: The MAC cuobjdump support is limited to parsing and decoding CUDA ELF objects within the Mach-O host binaries.

License Related

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NPP License (txt):

NPP_License.txt

License file for the NVIDIA Performance Primitives (NPP) library

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Software License Agreement for NVIDIA CUDA Toolkit:

EULA.txt

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Document Change History

DA-05671-001_v01

Version	Date	Authors	Description of Change
01	April 7, 2011	CUDA	Initial release for CUDA Toolkit 4.0

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